ENDOTRACHEAL-ESOPHAGEAL INTUBATION DEVICES

CROSS-REFERENCE TO RELATED APPLICATION

The present application is a continuation-in-part of my application Ser. No. 07/679,197, filed Apr. 2, 1991, now abandoned.

BACKGROUND OF THE INVENTION

The present invention relates to intubation devices for use in performing artificial respiration and the like.

Among the devices employed during cardiopulmonary resuscitation (CPR) are various types of airways, including esophageal airways (EOA) and esophageal tracheal combitubes (ETC).

EOAs, one example of which is disclosed in U.S. Pat. No. 4,497,318, must be inserted into the esophagus. If, during insertion, the airway should enter the trachea, it must be withdrawn and reinserted. While, in the hands of a skilled individual, and under normal conditions, such a tube will enter the esophagus, it will initially pass into the trachea in a not insignificant percentage, and perhaps 5–10%, of cases.

In an effort to eliminate the need to insert such a device more than once, various type of ETCs have been proposed. These consist essentially of two tubes disposed side-by-side and having respective air inlets. If the device is inserted into the esophagus, air is blown in via the inlet associated with one tube, whereas if the device initially finds its way into the trachea, air is blown in via the inlet of the other tube. Since each tube must have the cross section required to permit introduction of the required quantity of air, the overall device would, as a rule, have to have at least one relatively large transverse dimension, which makes insertion more difficult and increases possible patient discomfort. In addition, after the device has been inserted, and its location ascertained, time is required to connect the associated air source, such as a bag-valve, to the appropriate tube and care must be taken to verify that connection is being made to the correct tube under emergency conditions. Thus, while ETCs have alleviated certain of the problems associated with the use of such airways, their use nevertheless presents certain complications which will act to delay the start of CPR.

Another device of this type, disclosed in U.S. Pat. No. 3,874,377, employs, in effect, a single tube having an adapter inserted therein for allowing the airway to be utilized whether it has been inserted in the trachea or the esophagus. According to one embodiment disclosed in this patent, the adapter is provided at its distal end with a plug which seals the lumen in the airway, and is further provided with a sleeve which can be moved to selectively open or block passages provided in the region of the proximal end of the airway. When the airway has been inserted to the trachea, the adapter is not inserted, or is removed, and the sleeve is moved into a position in which it blocks the passages located adjacent the proximal end of the airway. Air can then be introduced directly into the patient's lungs. On the other hand, when the airway has been inserted into the patient's esophagus, the adapter is introduced in order to block flow of air directly through the airway and the sleeve is moved to the position in which it opens the passages in the vicinity of the proximal end of the airway, so that air can then be introduced into the patient's lungs.

This embodiment has certain drawbacks. Particularly, it is intended to be initially inserted with the sleeve in the position in which it blocks the passages adjacent the proximal end of the airway and the adapter not inserted. If, in this condition, the airway is inserted into the esophagus, normal flow of air to the patient's lungs will be blocked during the time of insertion of the airway, which can be of some duration, and until it has been determined, by appropriate tests, that the airway is, indeed, in the esophagus and not in the trachea. Thus, during this interval, the patient's condition can be worsened by the airway itself. In addition, in this embodiment, the sleeve can be inadvertently moved from its intended position by contact with interior surfaces in the patient's mouth or throat.

In a second embodiment disclosed in the cited patent, the adapter is secured at the proximal end of the tube, or airway and includes an outer sleeve which may be integral with the airway and an inner sleeve which is rotatable within the outer sleeve between two end positions. In one end position, the distal end of the adapter cooperates with a blocking member disposed at the interior of the airway to close the longitudinal passage which extends through the airway and to open the lateral passages adjacent the proximal end of the airway. In the other end position of the inner sleeve, the lateral passages adjacent the proximal end of the airway are blocked and the longitudinal passage through the airway is opened. Thus, this embodiment also has the drawback that during the time of insertion of the airway, there is always the possibility, regardless of the initial position of the inner sleeve, that the passage to the patient's lungs will be blocked until the actual disposition of the airway within the patient has been determined.

SUMMARY OF THE INVENTION

It is the primary object of the present invention to reduce the time needed to position an airway and commence CPR.

Another object of the invention is to simplify the procedure required to perform CPR with the aid of an airway.

Yet another object of the invention is to minimize the transverse dimensions of such an airway while allowing for adequate air flow.

A further object of the present invention is to avoid the danger of medical complications during intubation of a patient.

Another object of the invention is to provide an intubation apparatus which is characterized by structural simplicity and ease of utilization.

The above and other objects are achieved, according to the invention, by the provision of intubation apparatus comprising:

an airway device composed of a first hollow tube having a wall, a proximal end, a distal end, at least one first opening located in the wall between the proximal and distal ends, and a second opening located in the wall between the first opening and the distal end, the first hollow tube being insertable, via its distal end, into a patient's mouth and into one of the esophagus and trachea of the patient, the first hollow tube providing a first air flow path between the proximal end and the distal end of the first hollow tube and a second air flow